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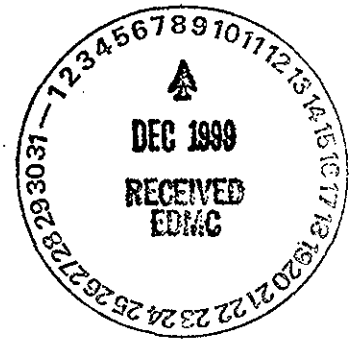

Mr. E. R. Skinnarland
200 Area Section Manager
Nuclear Waste Program
State of Washington
Department of Ecology
1315 West 4th Avenue
Kennewick, Washington 99336-6018

Addressees:

RESPONSE TO REGULATORY COMMENTS ON DRAFT A AND TRANSMITTAL OF DRAFT B OF THE 200-CS-1 OPERABLE UNIT REMEDIAL INVESTIGATION/ FEASIBILITY STUDY (RI/FS) WORK PLAN AND RESOURCE CONSERVATION AND RECOVERY ACT (RCRA) TREATMENT, STORAGE, AND DISPOSAL (TSD) UNIT SAMPLING PLAN

Attached please find two copies of the 200-CS-1 Operable Unit RI/FS Work Plan and RCRA TSD Unit Sampling Plan, Draft B, DOE/RL-~~99-07~~ 99-44 (Attachment 1), for your information.

Comments received on the review of Draft A from the State of Washington Department of Ecology have been dispositioned and incorporated, where appropriate. A copy of the final comment dispositions is provided as Attachment 2. 51712

This work plan is slated for public review starting December 13, 1999. This work plan is the second of several to follow the streamlined approach for characterization and remediation of the 200 Areas as described in "200 Areas Remedial Investigation/Feasibility Study Implementation Plan – Environmental Restoration Program," DOE/RL-98-28. The work plan contains the elements of a Comprehensive Environmental Response, Compensation, and Liability Act RI/FS work plan and RCRA TSD unit sampling plan. A sampling and analysis plan is included as an appendix to the work plan.

Following the public review period, comments will be incorporated and a Revision 0 prepared for submittal to Ecology and the U.S. Environmental Protection Agency.

If you want to discuss this matter further or require additional information, please contact me at 376-7087.

Sincerely,

Bryan L. Foley, Project Manager
Groundwater/Vadose Zone

GW/VZ:BLF

Attachments: As stated

cc w/attachs:
B. L. Becker-Khaleel, Ecology
W. W. Soper, Ecology
L. C. Treichel, EM-442

cc w/o attachs:
B. H. Ford, BHI
M. E. Todd, CHI
C. D. Wittreich, CHI

Draft Comment Resolutions for Official Ecology Comments on DOE/RL-99-44 Draft A 200-CS-1 Operable Unit RI/FS Work Plan and RCRA TSD Unit Sampling Plan

General Comments

1. The Work Plan references several other documents which have not been approved. Whenever possible, repeat the appropriate information from these documents in this Work Plan and delete the references.

Response: The work plan utilizes approved documents when applicable. However, there are a large number of references that are not approved but are essential to the development of the work plan. It is not practical to repeat the information in all cases. This was discussed in further detail with Ecology during a comment resolution meeting on November 2, 1999. No change to the document.

2. The Work Plan provides an excellent description of the TSD units included in the operable unit. However, the RCRA RPP sites (216-W-LWC, UPR, 200-W-34, and 216-S-11 Pond) have been almost completely eliminated from the text. The RCRA RPP sites need to be addressed in the text (including Chapters 2 and 3) and a justification of why they are analogous sites should be provided.

Response: In developing an outline for 200 Area operable unit work plans as part of the Implementation Plan, there was a strong desire by all parties to have a streamlined work plan. As a result, the work plan was intended to focus on those waste sites that were to be characterized (i.e., representative and RCRA TSD sites). Additional text justifying why the 200-CS-1 waste sites are analogous will be added to Section 2.2.2.

3. The text continually refers to the 2 representative sites and the 2 TSD sites in the 200-CS-1 OU. There are 4 TSD sites in the 200-CS-1 OU, two of which are representative. Please correct the text.

Response: Comment accepted. The 216-S-10 Pond and Ditch represents one TSD Unit. Text will changed accordingly.

4. All references to the DQO summary report includes (BHI 1999 [pending finalization]), search and remove the [pending finalization] from the document.

Response: Comment accepted. The DQO report has since been finalized and the reference will be updated.

5. Measure all sample collection points from the same origin (e.g., either below sediment layer or below ground surface).

Response: See response to general comment #6.

6. It is not clear how some of the sample collection sites and depths were established. Ecology would like to have a presentation and discussion on this topic.

Response: This subject was discussed with Ecology during a comment resolution meeting on November 2, 1999. The figures illustrating the sampling locations will clarify the following: 1) sample depths are based on two datum's, 2) the figures are example illustrations and the below top of sediment (BTS) datum is variable, 3) when below ground surface (BGS) and BTS sample intervals coincide, a single sample will be collected.

Specific Comments

1. Page 1-1, third paragraph, sixth line: "216-11" should be changed to "216-S-11."

Response: Comment accepted. See general comment #3. Text will changed accordingly.

2. Page 1-2, first paragraph, second line: "four waste sites" should be changed to "the four RCRA TSD sites."

Response: Comment accepted. Text will changed accordingly.

3. Page 1-3, Figure 1-1: Public involvement (PI) requirements for the RCRA closure plan need modification. The first block indicates that Chapters, 2,3,4 and 5 of the Closure Plan will be included in the RI/FS work plan. The third block indicates that chapters 6,7, and 8 will be addressed in the FS/Closure Plan. The FS/Closure Plan is one of the documents to be available through the administrative record for public review. The problem with dividing the chapters between the work plan and the FS/Closure Plan is that not all closure chapters will be subjected to public review.

Response: This subject was discussed with Ecology during a comment resolution meeting on November 2, 1999. This approach was developed to be consistent with the Implementation Plan. Closure Plan Chapters 2-5 will have undergone a public review via this work plan and Chapters 6-8 will be made available to the public during the proposed plan step. The Implementation Plan provides the flexibility to adjust the approach to closure plan documentation to meet operable unit-specific needs. No change to the document.

4. Page 2-4, first paragraph, sixth line: The 216-B-C3 lobe is not shown on any of the figures. Please add where appropriate.

Response: Comment accepted. Change sentence to read, "One of the approved land disposal structures is located about 600 m east of the 216-B-3C lobe and receives plant-treated liquid wastes from the 200 East and 200 West Area facilities (Figure 2-7)."

Figure 2-7 will be modified to show labels for each B Pond lobe and the treated waste facility.

5. Page 2-4, Section 2.1.4: Add and overall statement discussing groundwater flow as it relates to the waste sites in the 200-CS-1 OU (e.g., how far below and which direction it is moving).

Response: Comment accepted. Add new paragraph at the end of the section to describe the groundwater depth and flow direction below each TSD site. "The depth to the water table beneath each waste site varies greatly. The depth to water beneath the 216-B-63 Trench is about 73 m below ground surface and is nearly flat with local groundwater flow from east to west due to groundwater recharge from the 216-B-3 pond system. The depth to water beneath the 216-A-29 Ditch varies from about 85.3 m at the head end to about 53 m at the lower end with groundwater flow generally to the west-southwest due to a groundwater recharge from the 216-B-3 pond system. The depth to water beneath the 216-S-10 Ditch and Pond area (including 216-S-11) varies from about 68 m at the head end to about 61 m at the lower end with groundwater flow generally to the east-southeast. The depth to water beneath the 216-W-LWC is about 85 m with groundwater flow generally to the east."

6. Page 2-5, first paragraph, third line: Change "aboveground" to "surface."

Response: Comment accepted. Text will changed accordingly.

7. Page 2-5, first paragraph, fifth line: Change "waste group" to "200-CS-1 OU."

Response: Comment accepted. Text will changed accordingly.

8. Page 2-5, fourth paragraph, first line: Change "these streams" to "the chemical sewers." Make same correction on lines six and seven.

Response: Comment accepted. Text will changed accordingly.

9. Page 2-5, fifth paragraph, second line: "216-B-63 Ditch" should be changed to "216-B-63 Trench".

Response: Comment accepted as stated.

10. Page 2-9, Section 2.2.2.2, fourth paragraph: Include a discussion of any previous or planned investigation of potentially contaminated soil resulting from the 216-B-63 Trench leak.

Response: Comment accepted. Add sentences, "Chemical and radiological analyses of the contaminated sediments excavated during the pipeline upgrade were not found. No investigations of the area are planned at this time. The leak occurred at the head end of the pipeline adjacent to the B Plant facility boundary.

11. Page 2-10, Section 2.2.2.3: Include the year of construction in the Ditch description.

Response: The year of construction is unknown but we do know that the ditch first starting receiving waste in May 1952 which will be added to the text.

12. Page 2-10, fifth paragraph: This paragraph needs clarification. It states the Ditch remained in use until 1984 and the next sentence states the Ditch last received discharges during 1991. Explicitly state that after the south end of the ditch was filled the north end remained open for use.

Response: Comment accepted. Text was modified as follows: "The south-end of the 216-S-10 Ditch remained in use until 1984, when the ditch was backfilled and stabilized. The north-end of the ditch remains open to a depth of approximately 3 m (10 ft). The north-end of the ditch last received discharges during 1991 (BHI 1995) and the supplying pipeline was plugged with concrete near the outfall in July 1994.

13. Page 2-10, Section 2.2.2.4, first paragraph, last sentence: The reference to Section 2.2.2.2 should be Section 2.2.2.3.

Response: Comment accepted. Text will be changed accordingly.

14. Page 2-11, Section 2.4, first paragraph: Please revise the discussion of effluent discharges. Delete the words "Limited quantities of" and "in trace amounts." These are relative terms and may be interpreted differently (e.g., most people would not consider the quantities listed in Tables 3-1 and 3-2 to be "trace amounts").

Response: Comment accepted. Text will be changed accordingly.

15. Page 2-11, Section 2.4, first paragraph, last sentence: The last sentence refers to the bullets as "observations" it may be more appropriate to call them "assumptions" or "hypotheses."

Response: Comment accepted. Observations will be changed to assumptions.

16. Page 2-11, last bullet: This bullet states the short time of use may have precluded breakthrough of effluent to the groundwater, however, Figures 2-12 through 2-17 imply the contaminant are entering the groundwater. These figures may need modification to eliminate any misunderstanding.

Response: Comment noted. The figures represent worst-case scenarios that are consistent with the AAMS interpretation of the liquid effluent percolating through the vadose zone. No changes to the figures. The last sentence in this bullet will be deleted.

17. Page 2-12, second paragraph, second line: Figure numbers should be "2-12 through 2-14."

Response: Comment accepted. Text will be changed accordingly.

18. Page 3-1, Section 3.0, last sentence: This sentence is unclear, interim status in the closure plan, should be clarified.

Response: Comment accepted. This sentence will be modified as follows: "Section 3.2 contains a historical description of the RCRA interim status groundwater monitoring system and the results of this monitoring."

19. Page 3-2, Section 3.1.1.3, second paragraph: Insert the following bolded text. "Radionuclide inventory **and effluent volume** information for...."

Response: Comment accepted. The bolded text will be inserted.

20. Page 3-2, Section 3.1.1.3: A tremendous amount of analytical data is provided in this section of the text. It would greatly benefit the reader if the data could be put into a table showing the years samples were collected (subdivided by sampling location/type), constituents measured, and the resulting data.

Response: See response to specific comment # 21.

21. Page 3-2, Section 3.1.1.3: When providing analytical data or field survey information, please indicate if values are normal background, exceed an action level, etc. Indicate how this data is of value to this work plan.

Response: This subject was discussed with Ecology during a comment resolution meeting on November 2, 1999. The 1998 data is considered high quality and representative of current conditions, and an evaluation with regard to MTCA is provided. Other data provides a historical perspective only and a comparison to action levels is not considered to be useful or applicable. Text will be added to Section 3.1 clarifying what types of data are germane for a historical perspective only, versus representative of current conditions.

22. Page 3-3, second paragraph: Provide information from Table 4-11 of the PUREX AAMS report. Suggest rephrasing the next sentence and using "the data indicates" rather than "judging."

Response: Comment accepted. The table will be added and the text will be changed accordingly.

23. Page 3-3, fourth paragraph: Samples were collected in 1991 from vegetation and soil. However, only soil data is provided. The samples collected from the trees

would be indicative of root update of below ground contamination if it were present. Provide available vegetation data.

Response: Comment accepted. The following sentence will be added: "No radionuclides were found above background levels in any of the vegetation samples."

24. Page 3-3, last paragraph: Data collected during 1988 and 1998 sampling is discussed, applicable data collected in 1991 should be included.

Response: See response to specific comment # 21.

25. Page 3-4, first paragraph: Section 3.3 should be Section 3.2.

Response: Comment accepted. Text will be changed accordingly.

26. Page 3-5, second paragraph: According to this sentence a quantity of 7.6 kg of uranium was discharged to the 216-B-63 Trench, however, Table 3.1 lists 21.2 kg of uranium released to the Trench. Also, where does the total beta discharge of 8.7Ci come from? Please clarify or correct as appropriate.

Response: The sentence will be deleted from the Page 3-5. The 7.6 kg of uranium and total beta discharge of 8.7 Ci was calculated from discharge data as of 12/31/73. The 21.2 kg of uranium in Table 3.1 lists the current inventory according to the 200 Area Waste Site Grouping Report.

27. Page 3-5, several paragraphs: The last sentence of the first paragraph, "As of 1987, the waste discharged to 216-B-63 was no longer considered to be dangerous waste." The last sentence of section 3.1.2.2 states "....of corrosive waste were managed in the 216-B-63 Trench for the period form 1970 to 1992." And the first sentence of Section 3.1.2.3 states that "Analytical data....was obtained from October 1989 through March 1990 to determine if this stream was designated as a dangerous waste." These dates appear to contradict each other and the management vs discharge of waste is not obvious, please clarify the text, suggest putting the dates into chronological order.

Response: Comment accepted. The Part A Permit Application states that corrosive discharges ceased in 1985. The dates in the last sentence of the first paragraph on Page 3-5 and the last sentence of Section 3.1.2.2 will be changed to "1985."

Additional sampling was conducted from October 1989 to March 1990 in order to determine if other contaminants (other than corrosive waste) in the waste stream could be designated as dangerous waste. The text in Section 3.1.2.3 will be clarified to reflect this statement.

28. Page 3-5, last paragraph: Section 3.3 should be Section 3.2.

Response: Comment accepted. Text will be changed accordingly.

29. Page 3-7, third paragraph: Provide information from Table 4-10 and 4-11 of the S Plant AAMS report. Also, suggest changing following sentence to incorporate "the data indicates" and delete "judging."

Response: Comment accepted. The two tables will be added and text will be changed accordingly.

30. Page 3.7, fifth paragraph: Section 3.3 should be Section 3.2.

Response: Comment accepted. Text will be changed accordingly.

31. Page 3-7, Section 3.2: 216-B-63 Ditch should be 216-B-63 Trench.

Response: Comment accepted. Text will be changed accordingly.

32. Page 3-8, first paragraph, next to last sentence: Insert bolded text ".....RCRA **TSD** sites."

Response: Comment accepted. The bolded text will be inserted.

33. Page 3-8, Section 3.2.1.3: The wells 699-43-43 and E25-48 are not shown on the referenced figure.

Response: Comment accepted. Well 699-43-43 is east of the map boundary and a note will be made on Figure 2-2. Well E25-48 was mislabeled as E25-46 on the figure. Figure 2-2 will be corrected.

34. Page 3-10, second paragraph, last sentence: The first upgradient well is listed as 299-E27-3, this appears to be a typographical error, in the previous paragraph it was listed at 299-E27-8.

Response: Comment accepted. The well number should be 299-E27-8.

35. Page 3-10, Sections 3.2.3.1 and 3.2.3.2: Suggest combining these two sections since they are identical.

Response: Comment accepted. The wrong text was inserted into 3.2.3.2 and will be replaced with text addressing aquifer identification

36. Page 3-12, Section 3.3: This section is supposed to provide "information pertaining to contaminant sources, release mechanisms, transport media, exposure routes, and receptors" to "develop a conceptual understanding of potential risks

and exposure pathways." The information provided in this section is inadequate. Suggest further development of risk assessment for inclusion in RI/FS documents.

Response: This subject was discussed with Ecology during a comment resolution meeting on November 2, 1999. A paragraph will be added to Section 3.3 discussing 200-CS-1 specific refinements (Figure 3-1) to the baseline 200 Area-wide exposure model in the Implementation Plan.

37. Page 3-13, bullets: The criteria for exclusion of certain constituents seems to be different than the list provided in the DQO. Please provide the criteria as provided in the DQO verbatim.

Response: Comment accepted. The exclusion criteria will be revised for consistency with the DQO Summary Report.

38. Figure 3-1: Potential Biotic Receptors were not addressed in this table.

Response: Comment accepted. Figure 3-1 will be modified to address potential biotic receptors.

39. Table 3-1: The RPP UPR-200-W-34 needs to be added to the table.

Response: Comment accepted. Table 3-1 will be modified to include UPR-200-W-34.

40. Table 3-3: The List of Contaminants of Concern, provided in the Work Plan, is not the same list provided in the DQO. Provide the Table 1-7 from the DQO verbatim.

Response: Comment accepted. The List of Contaminants of Concern will be revised for consistency with Table 1-7 from the DQO Summary Report. However, the revision to the Work Plan will not be verbatim from the DQO, several COCs were listed twice in error in the DQO report. In addition, thiocyanate (mercuric thiocyanate) shown in Table 1-7 of the DQO Summary Report, was listed in error since it was excluded in Table 1-6 in the DQO summary report. The DQO summary report in the process of being corrected.

41. Page 4-1, second paragraph, last sentence: Add (BHI 1999) to the reference to the DQO process summary report.

Response: Comment accepted. Text will be changed accordingly.

42. Page 4-1, Section 4.1.1, first paragraph: Please clarify that the data collected will be used to prepare a partial risk assessment. RESRAD only models radiation doses and does not consider risk from the dangerous waste constituents.

Response: Comment accepted. Varying degrees of qualitative risk assessment will be used as needed based on the results of the laboratory analysis of the samples collected. For example, the first degree will be the evaluation of the data against the preliminary remediation goals for the operable unit. If no chemicals exceed the PRGs (i.e., MTCA or other standards as specified in the work plan), no additional risk assessment is warranted. However, if chemical concentrations exceed PRGs, some additional analysis may be warranted. For example, if concentrations greatly exceed PRGs and a remedial action is inevitable, the analysis may not be cost effective. If concentrations are near or only slightly above PRGs, a more extensive degree of risk assessment may be warranted to evaluate other exposure scenarios more in line with the site-specific characteristics. The degree of risk assessment is highly dependent of the data from the investigation. This may require more sophisticated risk modeling or fate and transport modeling. The following modification was made to the parenthetical:

"(e.g., RES idual RADioactivity Dose Model [RESRAD] or other risk modeling, as required)"

43. Page 4-1, last paragraph: Please clarify the statement about collection of an additional sample to determine if residual contamination remains in the soil column. State where this sample will be collected, what COCs will be analyzed, once the data is collected state how it will be used.

Response: Comment accepted. The sample is not an additional sample per se, but was defined in the DQO requirements. The purpose was to collect a sample near the historically high water table when the site was operational. This sample location is considered to be representative (e.g. isolated from other contaminant source) of deep contaminants originating from the waste site of interest. Otherwise, deeper samples in the soil column (historically beneath the water table) could have been impacted from other sites via groundwater transport. The specifics of this sample location should be addressed in the SAP (Tables B3-2, B3-4 and B3-5) and is a detail not appropriate for Section 4.0. The paragraph will be deleted from 4.0 and the SAP will be modified to include the information requested.

44. Page 4-3, Section 4.1.3, first paragraph: Insert radiological requirements as one of the ARARs and PRGs.

Response: Comment acknowledged. Radiological constituents are contained within the regulatory thresholds/standards and derived risk-based thresholds described in this section. However, a typographical error is contained in this section. "Section 3.5" will be changed to "Section 3.4."

45. Page 4-3, Section 4.2.1, first sentence: Suggest deleting "at locations," implies multiple boreholes will be drilled.

Response: Comment accepted. Text will be changed accordingly.

46. Page 4-4, second paragraph: Specify how the sample at "the historic high groundwater table" will be identified.

Response: Comment accepted. See comment #43.

47. Page 4-4, fourth paragraph: Include Ecology in the approval of the drilling method.

Response: This subject was discussed with Ecology during a comment resolution meeting on November 2, 1999. The following sentence will be added: "If a drilling method, other than cable tooling will be used, Ecology will be notified".

48. Page 4-4, fifth paragraph: The DQO, Table 7-3, states that sonic drilling generates a significant amount of heat, which can alter samples and the surrounding formation. Suggest removing this method from the list of likely drilling methods. Additionally, the diesel hammer drilling method is not addressed in the DQO, provide a description of this method and potential impacts on samples.

Response: Comment acknowledged. ERC does not dictate specific drilling techniques to the drilling contractor. Rather, performance criteria are specified. This subject was discussed with Ecology during a comment resolution meeting on November 2, 1999. Because the sonic drilling technique is very fast, the contractor may elect to use that method to enhance productivity between the sampling intervals. Therefore, the sonic drilling technique will not be removed from the Work Plan. Rather, the drilling specification will require the use of a drilling technique that does not heat the sample media or the surrounding soil formations prior to, or in the sampling zones.

Text will be added to the Work Plan that describes the method and potential impacts of the diesel (Becker) hammer technique.

49. Page 4-5, section 4.2.2, first paragraph, last sentence: It is not clear how the current sampling plan and test pits will determine the extent of **lateral** contamination at the waste sites.

Response: This subject was discussed with Ecology during a comment resolution meeting on November 2, 1999. Test pit and borehole locations are distributed throughout/along the waste sites but within the waste site boundary. This sampling approach will allow an assessment of the lateral extent of contamination within the waste site boundary. No change to the document.

50. Page 4-5, Section 4.2.2, second paragraph: Specify what actions will be taken if contamination is observed at the maximum sampling depth and deeper samples can not be collected because of equipment limitations.

Response: This subject was discussed with Ecology during a comment resolution meeting on November 2, 1999. The remedial investigation is designed to support the

evaluation and selection of remedial alternatives. It is not essential that contamination be chased until it stops at this time. The borehole at each waste site performs this function to groundwater. Additional sampling will be performed as needed to support the remedial design (i.e., confirmatory sampling; see Section5.5). A paragraph will be added to Section 4.1.1 explaining how the sample intervals are designed to support the remedial decision process.

51. Page 4-6, Section 4.3, first paragraph: The "two deep boreholes" should be changed to "three deep boreholes."

Response: Comment acknowledged. The text will be modified to reflect "four boreholes."

52. Page 4-6, Section 4.3, first and sixth paragraphs: Explain how the additional high resolution spectra gamma-ray logging in well 299-W26-6 and 699-32-77 applies to the purpose of this RI/FS. Explain why the additional wells are being logged.

Response: Comment accepted. The following text will be added to Section 4.3 as the second to last sentence in the first paragraph: The SGL logging of existing wells in the vicinity of a waste site can be a cost effective method of providing supplemental data on the vertical and lateral distribution of gamma-emitting radionuclides, provided that the wells are located sufficiently close to the waste site and are appropriately constructed (e.g., single well casing in contact with the formation). Following an evaluation of the locations and designs of existing wells, wells 299-W26-6 and 699-32-77 were identified as suitable for logging.

53. Page 4-6, Section 4.3: Be consistent in the use of terminology (e.g., high resolution spectra gamma-ray logging, spectral gamma-logging, spectral/gamma logs).

Response: Comment accepted. Will use the term high resolution spectral gamma logging (SGL).

54. Page 5-1, Section 5.0, third paragraph: It appears the last reference to Section 5.4 should be corrected to reference Section 5.5, and reflect the correct section title.

Response: The reference is correct, however the text will be clarified.

55. Page 5-1, Section 5.1, first sentence: Insert the bolded text "...in particular, dangerous waste and dangerous **waste** constituents."

Response: The text will be changed accordingly.

56. Page 5-4, Section 5.2.2: There are several references to field screening which will be used to "assist in the selection of sample intervals," add text to clarify that

these would be additional samples since the sample intervals were already specified in the DQO.

Response: Comment accepted. The text will be changed accordingly.

57. Page 5-5, Section 5.2.3: Please explain why antimony and thallium are underlying hazardous constituents.

Response: - Antimony and thallium are not expected at 200-CS-1 waste sites, and the sentence will be deleted from this section. The subject of underlying hazardous constituents are discussed further near the end of Section B.3.3.1.

58. Page 5-6, Section 5.2.5.2, bullets: State the efficiency of the data evaluation methods when analyzing data collected through bias sampling.

Response: This subject was discussed with Ecology during a comment resolution meeting on November 2, 1999. In the first sentence of the last bullet in section, the term "statistical tests" will be changed to "analyses".

59. Page 5-6, last sentence: Reference to Section 5.1.5.3 is not correct.

Response: Comment accepted. The reference to Section 5.1.5.3 will be corrected to 5.2.5.3.

60. Page 5-7, Section 5.2.5.3: RESRAD models radionuclide dose only, provide additional information on modeling dangerous waste risk.

Response: Text will be clarified to read that other models may be used to assess groundwater impacts. See response to Comment 42.

61. Page 5-6, Section 5.2.5.3: This section needs more discussion relative to whether quantitative risk assessments may be useful and why. Earlier 100 Area qualitative risk assessments (QRA's) needed much improvement, and the 200 Area QRA's should learn from past actions. This should be discussed further. Suggest inserting the following text:

The application of risk assessment in the characterization and remediation of the 200 Area will follow a graded approach as described in Section 5.5 of the Implementation Plan. A QRA will be performed as part of the RI report and FS. Once additional data are available for all the sites in an OU, a more quantitative risk assessment may be performed. A quantitative, cumulative risk assessment will be used to evaluate remedial actions and close out the sites in the 200 Areas.

Response: The text will be added accordingly.

62. Page 5-7, Section 5.3: This section should provide information on the steps of the FS, however, it should not attempt to eliminate any of the alternative remedial actions. Suggest deleting all text on page 5-8, except top three bullets.

Response: This subject was discussed with Ecology during a comment resolution meeting on November 2, 1999. Text will be added to this section to clarify that 1) the potentially applicable remedial alternatives identified in this section are based on an initial screening, and remedial action alternatives will be reassessed as part of the final FS to develop a final list of alternatives, 2) the remedial alternatives are expected to require refinements or modifications based on site characterization data collected during the RI, and 3) new or emerging technologies will also be considered during the final FS. The term "final" will be deleted from the first sentence, last paragraph on page 5-8.

63. Page 5-9, first paragraph: Suggest rewriting this paragraph to be future activities which will be part of the FS once the RI is complete.

Response: Text will be added to clarify that final RAO's, PRG's and remedial action alternatives will be defined in the final FS.

64. Page 6-1, first paragraph: Change implementing this process to implementing this work plan.

Response: Comment accepted. Text will be changed accordingly.

65. Page 6-1, second paragraph: The reference to Appendix C appears to be incorrect.

Response: Comment accepted. The reference will be deleted.

66. Page 6-1, first bullet: Change nine test pits to ten test pits.

Response: Comment accepted. The text will be changed accordingly.

67. Page 6-1, Section 6.0: The dates presented in the six bullets do not correlate to the dates provided in the proposed TPA milestone bullets, and none of the dates appear to match the schedule presented in Figure 6-1. The project schedule needs to be reevaluated and corrected as appropriate.

Response: The text and associated schedule will be corrected to reflect the current detailed work plan (DWP) and to be consistent with the 200-CW-1 work plan.

68. Appendix A: The most recent revisions of each Part A, Form 3 for each TSD should be included in the Work Plan. Title pages for each Part A should specify that they are "Form 3." The Part A, Form 3's provided should include certification signatures.

Response: Comment accepted. Title pages will be changed accordingly.

69. Appendix A, A-1: The Part A, Form 3 provided for the 216-A-29 Ditch does not include the WT01 Dangerous Waste Number in Part IV.

Response: The text in Section 3.1.1.1, third bullet, the WT01(Extremely Hazardous Waste) code was mistakenly included. According to the Part A, Form 3 Dangerous Waste Permit Application, the 216-A-29 Ditch did not receive WT01 waste. This code will be deleted from the text in Section 3.1.1.1.

70. Appendix A, A-2: The title page for the 216-B-63 Trench is incorrect, the number should be changed from "116" to "216."

Response: Comment accepted. Text will be changed accordingly.

71. Appendix A, A-3: The Part A, Form 3 provided for the 216-S-10 Pond and Ditch was provided in duplicate, please delete unnecessary pages, remove map and photo erroneously inserted from the 216-B-63 Trench, and correct page numbers.

Response: Comment accepted. Duplicate pages will be removed.

72. Appendix B, Page B1-1, last paragraph: Suggest changing the sentence to "These sites were chosen because they are treatment, storage, and disposal (TSD) units and because one of the sites represents the worst-case scenario (i.e., 216-S-10 Ditch) and the other represents the typical scenario (i.e., 216-A-29 Ditch), as discussed....."

Response: Comment accepted. Text will be changed accordingly.

73. Appendix B, Page B1-2, Section B1.3.1: Suggest changing "An open unlined ditch...." To " The 216-A-29 Ditch, an open unlined ditch....."

Response: Comment accepted. Text will be changed accordingly.

74. Appendix B, Page B1-2, Section B1.3.1: Need to address the hydrazine release to the 216-A-29 Ditch so that the contained-in determination in Section B1.4 makes sense.

Response: Comment accepted. To maintain consistency, information with regard to the hydrazine contained-in determination will be added to the text similarly to that added to the 200-CW-1 Work Plan. Text will be added to state that hydrazine was released to the 216-A-29 ditch in Section B1.4.

75. Appendix B, Page B1-2, Section B1.3.2: This section discusses UPR-200-E-138. This unplanned release should be included in Section 2.1 of the work plan.

Response: Comment accepted. Text will to be changed. The text in parentheses is in error and will be deleted. The following sentence will be added to Section 2.2.2.2, third paragraph, after first sentence, "The trench started receiving cooling water on March 22, 1970, after there was an unplanned release (UPR-200-E-138) of 1000 Ci of strontium-90 into the 216-B-2-2 Ditch." The following sentence will be added to Section 2.2.2.2, third paragraph, after the last sentence: "In August 1970, the bottom and sides of the 216-B-63 Trench were dredged out and buried in the 218E-12B burial ground."

76. Appendix B, Page B1-3, Section B1.3.4: This section should include a site description.

Response: Comment acknowledged. The site description is provided in Section B1.3.3. This section will be removed and Section Heading for B1.3.3 will be changed to "216-S-10 Ditch/216-S-10 Pond."

77. Appendix B, Page B1-4, Section B1.5.1: The remedial alternatives listed comprise the reduced list, replace with the original list of remedial alternative.

Response: Comment accepted. The original list will be included.

78. Appendix B, Page B1-5, Section B1.5.3: The sentence " Section 5.2 of the work plan summarizes the sampling activities that are planned after the evaluation of initial characterization efforts (which are described in this SAP)" is not clear. The sampling activities in the work plan and SAP appear to be very similar, please further define the initial characterization efforts.

Response: Comment acknowledged. Reference to Section 5.2 was incorrect.. The sentence will be revised as follows: "Section 5.5 of the work plan summarized the additional sampling activities that are planned after the RI (which is described in this SAP)."

79. Appendix B, Table B1-1: This table does not match Table 1-7. Final COC List provided in the DQO Process Summary Report. Insert missing constituents.

Response: Comment accepted. See response to specific comment #40.

80. Appendix B, Table B1-2: This table does not match Table 5-5. Decision Rules provided in the DQO Process Summary Report. Reproduce the table, verbatim, updating references to Tables 3-7a and 3-7b.

Response: Comment accepted. Table will be modified accordingly.

81. Appendix B, Section 2.0: Ecology would prefer the term collocated be spelled co-located to emphasize the sampling collection method.

Response: This subject was discussed with Ecology during a comment resolution meeting on November 2, 1999. Comment was accepted and the text will be changed accordingly.

82. Appendix B, Page B2-2, Section B2.1.1: Please clarify which information is provided in Section B3.3.1 and which is provided in Tables B3-2 and B3-3.

Response: Comment accepted. Text will be clarified.

83. Appendix B, Page B2-3, Section B2.1.4: It is not clear how many batches or coolers of samples will be shipped, please clarify the number of trip blank which will be collected.

Response: Comment accepted. Add sentence " A total of eight trip blanks are expected to be collected as shown in Table B3-6.

84. Appendix B, Page B2-3, Section B2.3: The last sentence states "Final requirements will be identified on a Sampling Authorization Form." The sampling requirements should not be different than those specified in the DQO or Work Plan, clarify this sentence.

Response: This subject was discussed with Ecology during a comment resolution meeting on November 2, 1999. The sentence will be edit as follows " Final **sample collection** requirements will be identified on a Sampling Authorization Form.

85. Appendix B, Page B2-4, Section B2.6: Suggest using an independent party to perform data validation. In addition, the grouping of samples, packages, and delivery groups makes the discussion confusing, it is not clear how many data sets will actually be validated, clarify discussion.

Response: While the ERC procedure allows for BHI validation, the common practice is to have data validated through an independent contractor.

The text will be edited to reflect that at least one data package containing 20 sample sets will be validated.

86. Appendix B, Page B2-6, Section B2.7.1: Major changes in sampling locations should also require the approval of Ecology.

Response: Comment noted. Major changes would require the approval of Ecology; however, the unknowns in the field may necessitate minor location or sampling interval changes to avoid pipelines, underground structures, roads, or other conditions. This flexibility is necessary to the efficiency of the investigation and should have no impact on the data collection or the achievement of data quality objectives. If a change in location or sampling interval would not meet data quality objectives, Ecology will be consulted as we did for 200-CW-1 and the change in the borehole location at Gable Mountain Pond.

This will be clarified in the text.

87. Appendix B, Page B2-7, bullets: It is not clear where the sample location and depth will be recorded since they will not be on the sample container label. Please provide record location.

Response: Comment acknowledged. The sample location and depth are recorded in the field logbook. The last sentence of the first paragraph of Page B2-7 will be edited as follows: " The sample location, **depth**, and corresponding HEIS numbers will be documented...".

88. Appendix B, Page B2-7, Section B2.7.4: The sentence "The sampler will make a copy of the signed record prior to sample shipment and transmit the sample to ERC Sample....." appears to be incorrect. The word "sample" should be "Chain of Custody?"

Response: Comment accepted. The text will be changed accordingly.

89. Appendix B, Page B2-8, Section B2.7.6: Arrangements will need to be made with receiving laboratories to ensure the holding times for samples are not exceeded.

Response: Agree. Coordination with the laboratories regarding holding times was done during remedial investigation activities for 200-CW-1. In addition, evaluation of holding times is discussed in Section B2.6.

90. Appendix B, Page B2-9, Table B2-1: Since this is a TSD, Land Disposal Restriction (LDR) action levels should also be looked at. Further discussions are necessary on the RESRAD look up values for radionuclides and what levels will be used.

Response: Comment acknowledged. Table 2-1 is provided to enable comparison of the constituent detection limits against the specific action level requirements. The action levels associated with the 200-CS-1 remedial alternatives are the MTCA-B and MTCA-C cleanup criteria. These are appropriately evaluated in total concentrations (mg/kg). If any of the reported values are found to exceed the 20 times totals values for LDR consideration, the remaining laboratory sample media (or drummed drill cuttings) will be analyzed by the Toxicity Characteristic Leachate Procedure (TCLP) to enable the absolute determination of the LDR status. Table 2-1 will be footnoted to indicate the need for TCLP analysis if the ICP results exceed the 20 times totals values

The Hanford Comprehensive Land Use Plan Environmental Impact Statement was just issued, establishing the Industrial-Exclusive land use for the Hanford 200 Areas. RESRAD modeling has not been performed yet for the 200-CS-1 waste sites with the exposure scenarios identified in the DQO Summary Report. When the radiological

analytical results are obtained, they will be used as inputs to the RESRAD analytical model to determine compliance with the radiological cleanup requirements.

The following footnote was added to the end of Tables B2-1 and B2-2:
"Dangerous waste generation is not expected at this OU (a contained-in determination is expected for listed waste hydrazine). If generated, the concentrations of any underlying hazardous constituents will be evaluated against applicable regulatory requirements."

Footnote "i" was modified as follows:
"There are no preliminary action levels for radionuclides at this time. They will be developed in the remedial investigation/feasibility study process."

91. Appendix B, Page B2-9, Table B2-1: Several COCs from the DQO have been left off the list of Analytical Performance Requirements, correct omissions or add parentheticals where appropriate.

Response: Comment acknowledged. The "Hexanone" analyte in Tables B2-1 and B2-2 will be changed to Methyl Isobutyl Ketone" as shown in Table B1-1 and the DQO Summary report. See specific comment #40 regarding Thiocyanate.

92. Appendix B, Page B3-2, first paragraph: Please provide additional explanation on what type of visual surveys will be conducted and what observations will be made.

Response: The words "visually and" in the first sentence of the first paragraph on Page B3-2 will be deleted. The second sentence of the second paragraph on Page B3-2 will be edited as follows: " Field screening of excavated soil or drill cuttings **and visual observations of the soil (i.e., sediment/clay layer, organic debris)** will be used to identify the bottom of the ditch, pond, or trench where contamination is expected to be greatest (i.e., ditch/pond bottom sediment layer);".

93. Appendix B, Page B3-2, second paragraph: Please provide additional explanation on the use of excavated soil or drill cuttings in determining the lateral extent of contamination perpendicular to the length of the ditch.

Response: The statement is incorrect and will be deleted.

94. Appendix B, Page B3-2, third paragraph: Provide a source for the 5ppm action level for volatile organic screening.

Response: No significant volatile organic contamination is expected at these sites. The action level of 5 ppm is considered low enough to appropriately to identify a hot spot, yet high enough to confirm contamination, based on field instrument detection capabilities; judgement call and no specific basis. No change to the document.

95. Appendix B, Page B3-3, second paragraph: Explain why the 216-S-10 Pond borehole will not be sampled until 50ft. It would seem samples at less depth would provide information on the lateral leaching of contaminants.

Response: This subject was discussed with Ecology during a comment resolution meeting on November 2, 1999. A sample will be collected from the 35 – 37 feet bgs with a reduced analyte list. Edits will be made to the appropriate text and tables.

96. Appendix B, Page B3-4, last paragraph: Explain how the analytical priority in Table B2-3 was established.

Response: Comment acknowledged. The following sentence will be added: "Analytical priorities are based on expected contaminant inventories and associated potential level of risk, and groundwater impacts. Those contaminants with the largest inventory, that are expected to be the greatest risk drivers and/or that are known to have impacted groundwater have the highest priority."

97. Appendix B, Page 3-5, second paragraph: Reference to Section 2.0 should be Section 5.0.

Response: Comment accepted. Text will be changed accordingly.

98. Appendix B, Page B3-6, third paragraph: The use of water or a fixant during backhoe operations may affect sample analyses, state what precautions will be used to protect sample quality.

Response: Comment acknowledged. The fixant/water is primarily applied to the spoils pile generated during excavation activities. The following sentence will be added: "Samples will be collected from non-wetted soils in trenches, whenever possible, when fixant/water is used for dust control." This consideration is important to minimize impacts on soil chemistry and maximize the representativness of the sample.

99. Appendix B, Page B3-6, fourth paragraph: Waste from the test pits and boreholes can not be disposed at ERDF prior to the ROD. Please clarify paragraph.

Response: This issue was addressed during the September Unit Managers Meeting. This work plan and appended SAP and waste control plan provides sufficient documentation to allow disposal of IDW to ERDF.

100. Appendix B, Page B3-18, Table B3-6: Refer to Sections B2.1.1, B2.1.2, and B2.1.3, the number of QC samples collected should be 2 for all types listed.

Response: Comment accepted. The text will be changed accordingly.

101. Appendix C, Waste Control Plan: The Work Scope Description lists nine test pits, correct to "ten." In the Site Description third sentence insert OU after 200-SC-1.

Response: Comment accepted. The text will be changed accordingly.

102. Appendix C, Page C-1, last line: Reference to Table B3-2 should be Table B1-1

Response: Comment accepted. The text will be changed accordingly.

103. Appendix C, Page C-3, Section C1.2.6: Will slurry waste be generated during sample collection? Please correct section as necessary.

Response: Comment acknowledged. Slurry waste is not anticipated to be generated during remedial investigation activities. However, if hard tool drilling is necessary in any of the borings, slurry waste may be generated. No changes to this section.

104. Appendix C, Figure C-1: The Central Waste Container Storage Area needs to be added to the figure and key.

Response: Comment accepted. The figure will be edited to be consistent with figures C-2, and C-3.

Administrative Comments

1. Page 2-3, third paragraph, last sentence: Suggest moving this sentence to the beginning of the geology section. Early reference to this figure assists the reader in understanding the geologic description.

Response: Comment accepted. Sentence will be moved to the end of the first paragraph in Section 2.1.2.

2. Page 2-6, second paragraph: A discussion of the volumes of liquids discharged to the chemical sewers may help put the text of the paragraph into perspective.

Response: Discussions regarding volumes of liquids released to the individual waste sites is provided in Section 3.0 of this work plan.

3. Page 2-11, second bullet: Change "contributed" to "deposited."

Response: Comment accepted. Text will be changed accordingly.

4. Page 2-11, third bullet: Insert.... with depth below "the sediment layers in the" waste sites.

Response: Comment accepted. Text will be changed accordingly.

5. Figures 2-2 through 2-4: Suggest replacing with Figures 4-1 through 4-3 since they are more complete (e.g., Figure 4-1 shows all the RCRA wells).

Response: Comment accepted. Appropriate figures will be edited to include RCRA wells.

6. Page 4-2, section 4.1.3: Use COPCs acronym where appropriate.

Response: COPCs were eliminated during the DQO process. The acronym "COCs" will be changed to" potential COCs."

7. Page 5-3, Section 5.2, last bullet: Change to match Section 5.2.5 heading.

Response: Comment accepted. Text will be changed accordingly.

8. Appendix B, first paragraph: Suggest changing "confirm" to "refine and/or validate" the site conceptual model.

Response: Comment accepted. Text will be changed accordingly.

9. Appendix B, Section B1.1, first paragraph: "After the water discharges ceased, and portions of the vadose zone remained....." suggest deleting "and."

Response: Comment accepted. Text will be changed accordingly.

10. Appendix B, Page B1-4, third paragraph: Capitalize the T in table, and dexcribed is misspelled.

Response: Comment accepted. Text will be changed accordingly.

11. Appendix B, Page B3-5, first paragraph: Suggest inserting the bolded text "Samples **for physical properties** will be....."

Response: Comment accepted. Text will be inserted.

12. Appendix C, Waste Control Plan: Correct Site Description third sentence, insert OU after 200-CS-1.

Response: Comment accepted. Text will be changed accordingly.

13. Appendix C, Page C-1, second paragraph, second sentence: Change "o" to "to."

Response: Comment accepted. Text will be changed accordingly.

14. Appendix C, Page C-4, second line: Change "waste storage area" to "CWCSA."

Response: Comment accepted. Text will be changed accordingly.

15. Appendix C, Page C-4, fourth paragraph, sixth line: Change "centralized storage area" to "CWCSA."

Response: Comment accepted. Text will be changed accordingly.

16. Appendix C, Figures C-2 and C-3: Keys should be corrected to "**Central** Waste Container Storage Area."

Response: Comment accepted. Text will be changed accordingly.